

Review of the Genus *Hypsicera* (Hymenoptera: Ichneumonidae: Metopiinae) from South Korea

Gyu-Won Kang¹, Jin-Kyung Choi¹, Kyong-In Suh², Jong-Wook Lee^{1,*}

¹Department of Life Sciences, Yeungnam University, Gyeongsan 38541, Korea

²Korean Entomological Institute, Korea University, Seoul 02841, Korea

ABSTRACT

Hypsicera has been reported six species from South Korea. In this study, we reviewed 13 species of South Korean *Hypsicera* including seven newly recorded species from South Korea. Female of *H. brevicornis* and *H. nigribasis* are reported for the first time from South Korea since first record. Additionally, *H. incarinata* and *H. yoshimoboi* are reported new to China. We provide diagnoses of six newly recorded species and descriptions of two new females. We also provide photographs of key characters of seven newly recorded species and a key to 13 species of South Korean *Hypsicera*.

Keywords: Taxonomy, new record, Eastern Palaearctic, China

INTRODUCTION

The subfamily Metopiinae is a cosmopolitan group comprising 836 species within 26 genera. Among them, 275 species have been recorded from the Eastern Palaearctic region (Yu et al., 2012). *Hypsicera*, is easily distinguished from other genera by the absence of an areolet and the back of its head dropping vertically from the hind margin of the lateral ocelli to the foramen magnum. Most species of this genus are koinobiont endoparasitoids of lepidopteran larvae, such as Gelechiidae, Pyralidae and Tortricidae. Sometimes they attack the larvae of Hymenoptera, after which they always emerge from the pupa (Townes, 1971).

Hypsicera is a cosmopolitan group that was reported with 63 species, 17 of which have been recorded from the Eastern Palaearctic region. Among the fauna of South Korea, only six species have been reported by Cha et al. (2000) and Tolkanitz (2007). During this study we reviewed seven unrecorded species, *H. bicolor*, *H. brevicornis*, *H. incarinata*, *H. intermedia*, *H. postfucalis*, *H. spiracularis* and *H. yoshimoboi*, from South Korea. Among them *H. incarinata* and *H. yoshimoboi* are also new to China. Here we report seven unrecorded species from South Korea with the diagnoses and photographs and females of *H. brevicornis* and *H. nigribasis* with new description. Also we provide a key to

13 South Korean species.

MATERIALS AND METHODS

The images of the specimens were taken using an Axio Cam MRc5 camera attached to a stereo microscope (Zeiss SteREO Discovery, V20; Carl Zeiss, Göttingen, Germany), processed using AxioVision SE64 software (Carl Zeiss), and optimized with a Delta imaging system (i-solution, IMT i-Solution Inc. Vancouver, Canada). The morphological terminology mostly follows that of Townes (1969). Abbreviations were as follows: ANSP, Academy of Natural Sciences of Philadelphia, Philadelphia, PA, 19103, USA; BBM, Bernice P. Bishop Museum, Department of Entomology, Honolulu, HI, 96817, USA; HU, Entomological Institute, Faculty of Agriculture, Hokkaido University, Sapporo, Japan; MACN, Museo Argentino de Ciencias Naturales, Avenida Angel Gallardo 470, 1405 Buenos Aires, Argentina; MHN, Muséum d'Histoire Naturelle, Route de Malagnou, CH-1211 Genève, Switzerland; MNHN, Muséum National d'Histoire Naturelle, Entomologie, 45 Rue de Buffon, Paris, 75005, France; NHM, The Natural History Museum, Department of Entomology, Cromwell Road, London, England, SW7 5BD, United Kingdom; MOMOI, Kobe Uni-

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***To whom correspondence should be addressed**

Tel: 82-53-810-2376, Fax: 82-53-811-2376
E-mail: jwlee1@ynu.ac.kr

versity, Faculty of Agriculture, Entomological Laboratory, Kobe, Japan (S. Momoi collection); YNU, Yeungnam University, Gyeongsan, Korea; ZIN, Zoological Institute, Academy of Sciences, St. Petersburg 199034, Russia; GW, Gangwon-do; GG, Gyeonggi-do; CB, Chungcheongbuk-do; CN, Chungcheongnam-do; GB, Gyeongsangbuk-do; GN, Gyeongsangnam-do; JB, Jeollabuk-do; JN, Jeollanam-do; JJ, Jeju-do; TD, Type depository; TS, Type species.

SYSTEMATIC ACCOUNTS

Order Hymenoptera

Family Ichneumonidae Latreille, 1802

Subfamily Metopiinae Förster, 1869

¹*Genus *Hypsicera* Latreille, 1829

Hypsicera Latreille, 1829: 288. TS: *Alomya* sp. near *femoralis* Gravenhorst (= *Hypsicera femoralis*) Monobasic.

Metacoelus Förster, 1869: 161. TS: *Exochus femoralis* Gravenhorst (= *Hypsicera femoralis*).

Polyclistus Förster, 1869: 161. TS: *Ichneumon femoralis* Fourcroy (= *Hypsicera femoralis*).

Plesioexochus Cameron, 1905: 202. TS: *Plesioexochus rufipes* Cameron (= *Hypsicera femoralis*) Monobasic.

Diagnosis. Combined face and clypeus strongly convex transversely, weakly convex longitudinally. Upper edge of face produced between antennal sockets as a short broad point that is bent slightly backward between the bases of the antennae. Back of head dropping, vertically from hind ocelli to foramen magnum. Lower tooth of mandible much shorter than upper tooth. Antenna rather short to long, filiform. Scutellum weakly convex, without a lateral carina. Areolet absent. Sternaulus broad, moderately long. Legs stout. Spurs of mid tibia approximately equal length. 1st tergite rather narrow basally, its spiracle near basal 0.35, its lateral longitudinal carina sharp, usually to the apex, its median dorsal carina sharp basally, usually obsolescent somewhere behind the middle of the tergite. Ovipositor sheath short, not surpassing the tip of the abdomen.

Key to species of the genus *Hypsicera* from South Korea (modified from Kusigemati, 1971)

1. Fore and mid tarsal claws pectinate 2
- Fore and mid tarsal claws simple 9
2. Areola confluent with basal area *H. makiharai*
- Areola separated from basal area 3

3. Antennal scrobe of frons strongly concave, unsculptured and polished. Second abdominal tergite with sublateral longitudinal carinae obtuse, becoming an obtuse round ridge posteriorly 4
- Antennal scrobe of frons not or weakly differentiated in structure and sculpture. Second abdominal tergite with sublateral longitudinal carinae sharp throughout 6
4. 2nd lateral area of propodeum as long as wide. Propodeal spiracle linear. Scutellum rather strongly convex *H. bicolor*
- 2nd lateral area of propodeum longer than wide. Propodeal spiracle elliptic or ovate. Scutellum exactly flat 5
5. Head with face longitudinally or obliquely and strongly rugoso-punctured *H. yoshimotoi*
- Head with face strongly and closely punctured *H. femoralis*
6. 1st flagellomere of antenna about as long as apical width. 2nd tergite with sublateral longitudinal carinae obtuse *H. postfurcalis*
- 1st flagellomere of antenna 1.5–2.6 times as long as apical width. 2nd tergite with sublateral longitudinal carinae sharp 7
7. Face strongly and rather sparsely punctate. Frons strongly and closely punctate. Hind leg reddish brown *H. intermedia*
- Face weakly and transversely rugoso-punctate. Frons finely punctate. Hind leg yellowish brown 8
8. Mandible unidentate. Frons polished, faintly and sparsely punctured. Hind femur 2.7 times as long as wide in lateral view. Hind tibia with basal and apical blackish bands distinct *H. rugosa*
- Mandible bidentate. Frons finely and closely punctate. Hind femur 2.4 times as long as wide in lateral view. Hind tibia with basal and apical blackish bands indistinct *H. harrelli*
9. Basal area of propodeum separated with areola. Legs yellowish brown to reddish brown 10
- Basal area of propodeum confluent with areola 11
10. 1st tergite with median longitudinal carinae extending to near apex of tergite. 2nd tergite without sublateral longitudinal carinae. Head with face transversely rugulose. Antennae with less than 25 flagellomeres. Legs moderately stout. Hind femur 2.3–2.7 times as long as wide in lateral view *H. brevicornis*
- 1st tergite with median longitudinal carinae present on basal 0.6–0.7 of tergite. 2nd tergite with sublateral longitudinal carinae. Head with face finely and closely punctured. Antennae with 39–41 flagellomeres. Legs

Korean name: ¹*수중다리몽톡맵시벌속

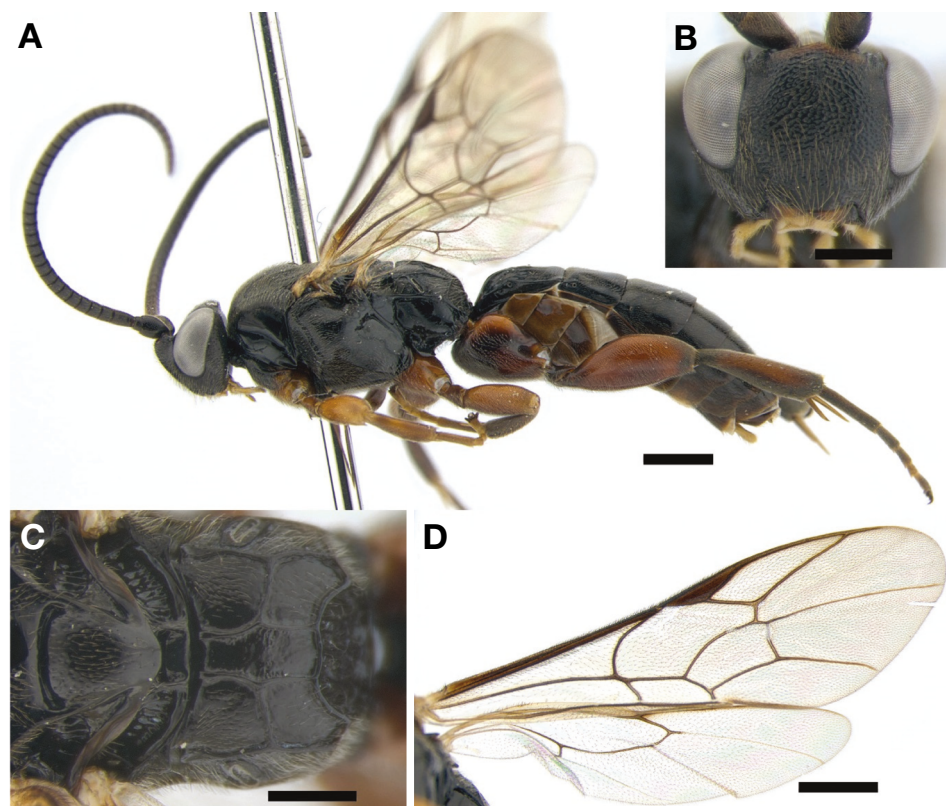


Fig. 1. *Hypsicera bicolor*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A, D=1 mm, B, C=0.5 mm.

- slender. Hind femur 3.2–3.5 times as long as wide in lateral view *H. carinata*
11. Antennal scrobe strongly projecting, polished with dense puncture *H. spiracularis*
- Antennal scrobe flat or weakly projecting, polished with or without puncture 12
12. 2nd tergite with sublateral longitudinal carinae absent. Forewing with radius originating beyond middle of stigma *H. incarinata*
- 2nd tergite with sublateral longitudinal carinae present. Forewing with radius originating from the middle of stigma *H. nigribasis*

^{1*}*Hypsicera bicolor* Momoi & Kusigemati, 1970 (Fig. 1)
Hypsicera bicolor Momoi & Kusigemati, 1970: 406. Type: female; TD: HU.

Material examined. South Korea: 1♂, CN: Dangjin-gun, Sinpyeong-myeon, Geumcheon-ri, 10 Sep 2006, Lee HS (YNU); 1♀, Seosan-si, Haemi-myeon, Daegok-ri, Hanseo Univ., 11–23 Jun 2009, Lee JW (YNU); 1♂, ditto, 9–21 Oct

2006, Kim JG (YNU); 1♀, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, 6–19 Jun 2008, Lee JW (YNU); 1♂, ditto, 24–30 May 2009, Kwon HJ (YNU); 1♀ 3♂♂, GB: Cheongdo-gun, Unmun-myeon, Unmunsa, 28 May 1989, Kim JG (YNU); 1♀, Gyeongsan-si, Dae-dong, Yeongnam Univ., 29 May 1989, Hwa GJ (YNU); 1♀, ditto, 30 May 1989, Kim JG; 1♂, ditto, 9 Jun 1989, Kim JG (YNU); 1♀, ditto, 16 Jun 1989, Kim JG (YNU); 1♂, ditto, 5 Sep 1989, Kim JG (YNU); 1♀, GG: Anyang-si, Manangu, Kwanag, 9–24 Jun 2007, Lim JO (YNU); 1♀, GN: Jinju-si, Gajwa-dong, 26 May–2 Jun 1987, Park JS (YNU); 1♀, Sancheong-gun, Sicheon-myeon, Jungsan-ri, Jirisan National Park, Sunduryu, 10 Jun 1989, Kim JG (YNU); 1♀, Ulju-gun, Sangbuk-myeon, Icheon-ri, 13 Jun 1989, Kim JG (YNU); 1♀, GW: Donghae-si, Samhwa-dong, Mureung valley, 21–30 May 2005, Lee JW (YNU); 1♀, JJ: Jeju-si, Ara 1-dong, Jeju Univ., Alt. 333 m, 1–10 Jun 2009, Lee JW (YNU).

Diagnosis. Female: Forewing 6.9 mm (6.0–7.3 mm), body 11.3 mm (10.5–12.0 mm).

Antenna blackish brown, dorsal part of scape black. Api-

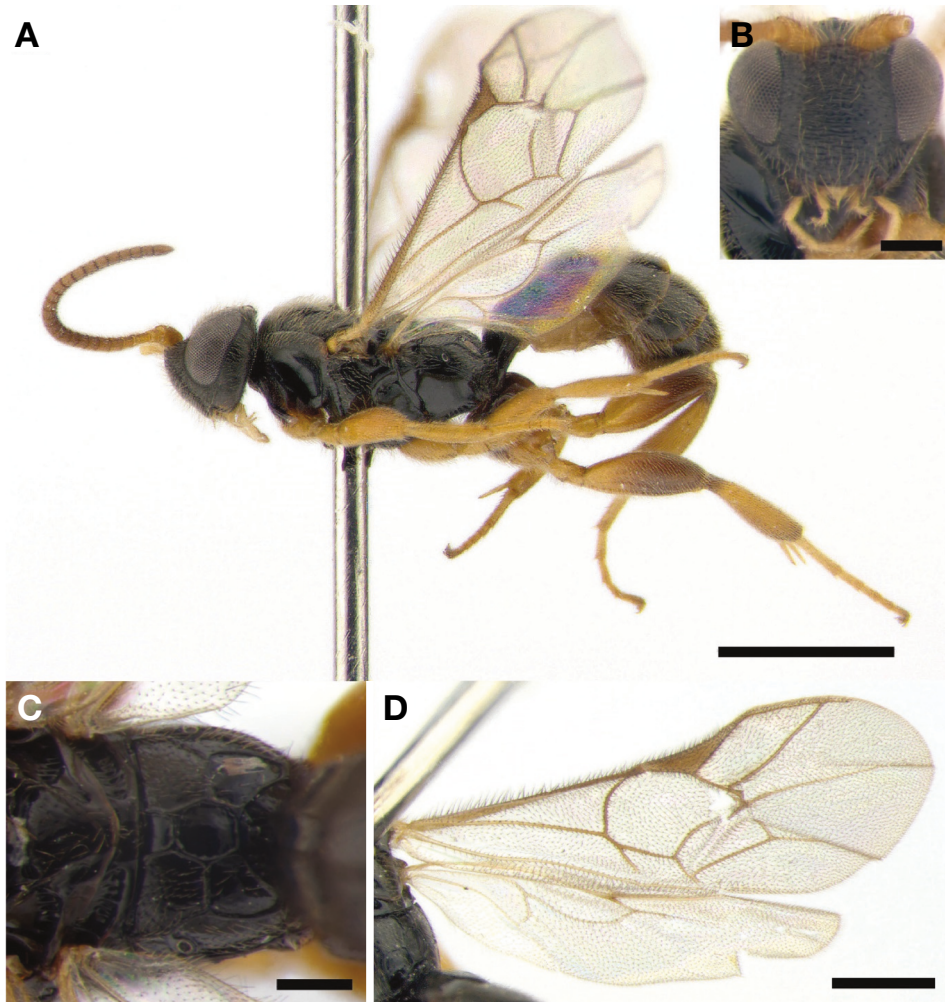


Fig. 2. *Hypsicera brevicornis*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A=1 mm, B, C=0.2 mm, D=0.5 mm.

cal of flagellum rather bright. Thorax black. Hind coxa, trochanter, trochantellus, femur and basitarsus brownish yellow, except for black basal part of basitarsus. Remainder segments of tarsus brown. Abdomen black.

Ocellus moderately large, its diameter 1.2 times as long as distance between lateral ocellus and eye. Antenna with 43 flagellomeres. First flagellomere 2.0 times as long as wide. Malar space 3.2 times as long as basal mandibular width. Epomia strong. Hind wing with seven distal hamuli. Legs moderately stout, hind femur 2.6 times as long as wide. Ratio between lengths of hind tarsal segments 9 : 4 : 3 : 2 : 3. Fore and mid tarsal claws pectinate. Hind tarsal claw simple. Basal area of propodeum not separated from areola by carina. Median dorsal carina strongly extending on basal 0.7 of the first tergite.

Male: Flagellum with 45 flagellomeres. Other characters as in female.

Distribution. South Korea (new record), Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

¹**Hypsicera brevicornis* Momoi & Kusigemati, 1970 (Fig. 2)

Hypsicera brevicornis Momoi & Kusigemati, 1970: 413.

Type: male; TD: HU.

Material examined. South Korea: 1 ♀, Seoul: Nowon-gu, Sanggye-dong, Mt. Suraksan, 18 Jul–24 Aug 2007, Lim JO (YNU).

Description. Female: Forewing 3.0 mm, body 4.2 mm.

Black. Head black. Palpi yellow. Mandible blackish

Korean name: ¹*짧은뿔수중다리몽톡맵시벌 (신칭)

brown with brown mandibular tooth. Antenna yellow with brown apical. Scape yellow. Pedicel bright yellow. Thorax black. Tegula yellow. Fore and mid leg yellow. Hind coxa blackish brown with yellow apical half. Trochanter and trochantellus yellow. Femur brown with yellow basal half. Tibia yellow with brown basal and apical. Tarsus yellow. Tarsal claw brown. Wings hyaline. Abdomen black.

In dorsal view, head slightly narrowed behind eyes, rather convex. Temple shorter than transversal diameter of eye. Ocellus moderately small, its diameter 0.7 times as long as the distance between the lateral ocellus and the eye. Frons coriaceous, finely striate-punctate, its antennal scrobe strongly concave, polished without punctures. Antenna with 24 flagellomeres, filiform. Scape densely punctate. First flagellomere 2.0 times as long as wide. Face almost rectangle, coarsely and densely punctate, puncture almost tending to transversely confluent. Clypeus not separated from face, with distant punctures. Mandible tapered apically. Malar space 1.2 times as long as basal mandibular width. Occipital carina present dorsolaterally.

Epomia present, notaulus weakly present. Postscutellum polished with dense puncture. Scutellum polished with fine puncture. Propleuron densely punctate, pronotum polished without puncture, extremely concave. Mesopleuron shiny, with a few sparse punctures. Prepectal carina complete, reaching the subtegular ridge. Metapleuron polished without puncture, pleural carina strong. Submetapleural carina complete. Hind wing with seven distal hamuli. Legs stout, hind femur 2.3 times as long as wide. Ratio between lengths of hind tarsal segments as 20 : 10 : 6 : 5 : 6. All tarsal claws simple. Basal area of propodeum separated from areola by carina. Propodeum polished with a few hair. Propodeal spiracle 1.5 times as long as wide.

Abdomen polished, with fine punctures. Median dorsal carina strongly extending to near apex of 1st tergite. Ovipositor sheath short, not surpassing tip of metasoma.

Male: No examined.

Distribution. South Korea (new record), Japan (Okinawa), Russia (Khabarovsk Kray).

Region. Eastern Palaearctic, Oriental.

Remark. Female characteristics of this species are described here for the first time.

¹**Hypsicera incarinata* Momoi & Kusigemati, 1970 (Fig. 3)

Hypsicera incarinata Momoi & Kusigemati, 1970: 411.
Type: male; TD: BBM.

Material examined. South Korea: 1♂, CB: Boeun-gun,

Sanae-ri, Songnisan National Park, Beomjusa, 5 May–31 Aug 2011, Jeong JC (YNU); 1♂, Daejeon: Dong-gu, Daejeon Univ., 12–27 May 2007, Lee JW (YNU); 2♂♂, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Simsimgyegok, 29 Aug–19 Sep 2014, Lee JW (YNU); 1♂, ditto, 30 Jul–29 Aug 2014, Lee JW; 1♂, GB: Gyeongsan-si, Dae-dong, Yeongnam Univ., 9 Jun 1989, Kim JG (YNU); 1♂, GN: Hadong-gun, Hwagae-myeon, Jirisan National Park, Daeseonggol, 29 Jul 1989, Kim JG (YNU); 1♂, GW: Donghae-si, Samhwa-dong, Mureung valley, 21–30 May 2005, Lee JW (YNU); 1♂, JN: Suncheon-si, Seungju-eup, Jukak-ri, Seonamsa, 10 Jul 1998 (YNU).

Additional material. China: 1♂, Sanhezhen, Yanbian, Jirin, Alt. 923 m, 22 Jul 2010, Lee JW (YNU).

Diagnosis. Male: Forewing 3.2 mm (3.0–3.6 mm), body 5.4 mm (5.4–5.7 mm).

Antenna yellowish brown. Scape more bright, dorsal part of scape black. Thorax brownish black. Hind leg yellow except for black basal of tibia. Abdomen reddish brown.

Ocellus moderately small, its diameter 1.3 times as long as distance between lateral ocellus and eye. Antenna with 32 flagellomeres. First flagellomere 2.2 times as long as wide. Malar space 2.3 times as long as basal mandibular width. Epomia present. Prepectal carina reaching half of the pronotum. Hind wing with five distal hamuli. Legs moderately stout, hind femur 3.2 times as long as wide. Ratio between lengths of hind tarsal segments 11 : 6 : 5 : 3 : 5. All tarsal claws simple. Basal area of propodeum not separated from areola by carina. Combined basal area and areola shiny with a few punctures. Second lateral area with some long setae. Propodeal spiracle 2.0 times as long as wide. Median dorsal carina weakly extending on basal 0.3 of the first tergite.

Female: No examined.

Distribution. South Korea (new record), China (Jirin-new record), Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

²**Hypsicera intermedia* Momoi & Kusigemati, 1970 (Fig. 4)

Hypsicera intermedia Momoi & Kusigemati, 1970: 409.
Type: male; TD: BBM.

Material examined. South Korea: 1♂, GG: Gwacheon-si, Makgye-dong, Mt. Cheonggyesan, 4 Jul 1989, Kim JG (YNU); 1♂, GN: Changnyeong-gun, Seongsan-myeon, Bang-ri, 26 Jun 1989, Kim JG (YNU); 1♀, GW: Wonju-si, Heungeop-myeon, Maeji-ri, Yeonsei Univ., 1–31 Jul 2010, Han HY (YNU); 1♂, Wonju-si, Panbu-myeon, Mt.

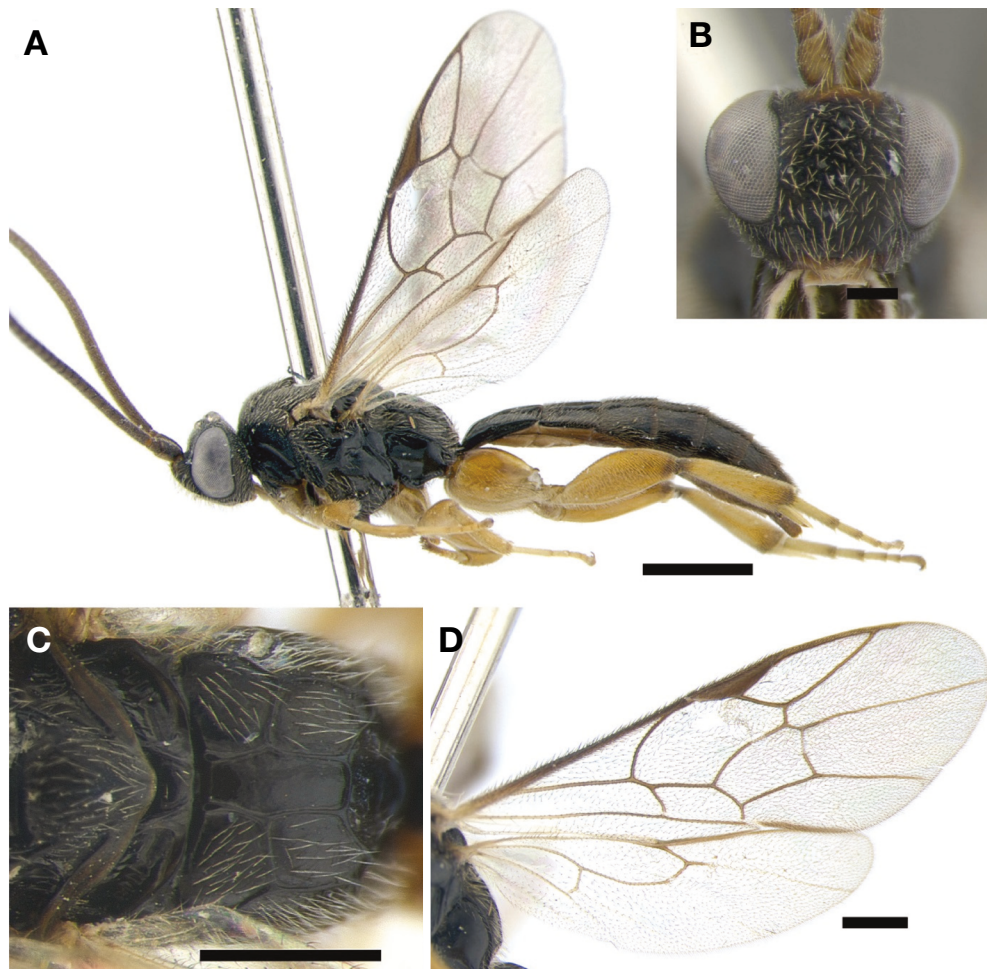


Fig. 3. *Hypsicera incarinata*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A = 1 mm, B = 0.2 mm, C, D = 0.5 mm.

Baegunsan, 30 Jul–28 Aug 2013, Lee JW (YNU); 2♀♀, Wonju-si, Socho-myeon, Hakgong-ri, Chiaksan National Park, 20 Jun–19 Jul 2013, Lee JW (YNU).

Diagnosis. Female: Forewing 5.3 mm (5.1–5.4 mm), body 8.5 mm (8.4–9.5 mm).

Antenna gradate blackish brown basal to brown apical. Thorax black. Hind legs brownish yellow with brown tarsal claws. Abdomen black.

Ocellus moderately small, its diameter 1.1 times as long as distance between lateral ocellus and eye. Antenna with 38 flagellomeres. First flagellomere 1.8 times as long as wide. Malar space 3.0 times as long as basal mandibular width. Occipital carina absent. Epomia strong. Hind wing with seven distal hamuli. Legs moderately stout, hind femur 3.5 times as long as wide. Ratio between lengths of hind tarsal segments 14 : 10 : 5 : 7 : 5. Fore and mid tarsal claws

pectinate. Hind tarsal claw simple. Basal area not separated from areola by carina. Propodeal spiracle 2.0 times as long as wide. 1st tergite polished without puncture. Median dorsal carina extending on basal 0.6 of the first tergite.

Male: Flagellum with 40 flagellomeres. Other characters as in female.

Distribution. South Korea (new record), Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

¹**Hypsicera postfurcalis* Kusigemati, 1971 (Fig. 5)

Hypsicera postfurcalis Kusigemati, 1971: 260. Type: female; TD: HU.

Material examined. South Korea: 1♀, Daegu: Dong-gu, Mt. Palgongsan, 7 Jul 1987, Kim JG (YNU).

Additional material. Japan: 1♀, Hokkaido, Sapporo-shi,

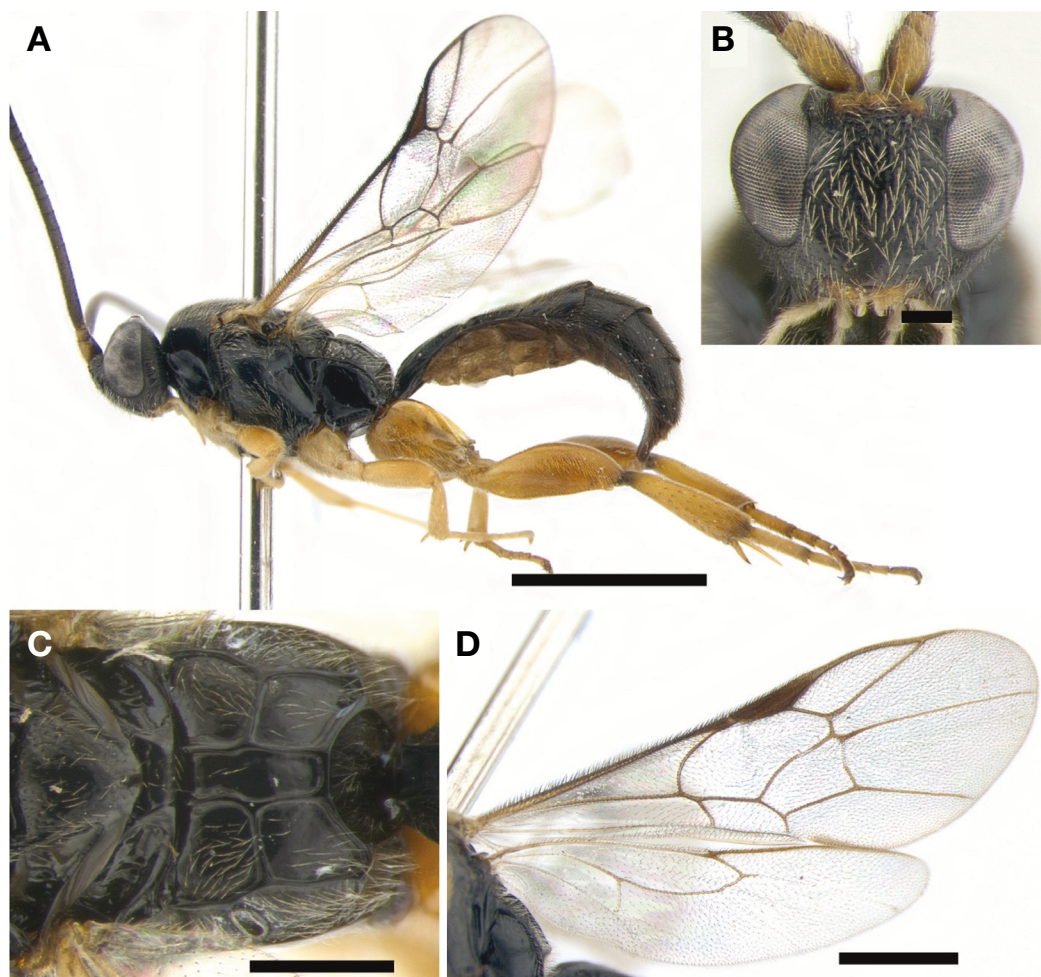


Fig. 4. *Hypsicera intermedia*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A = 2 mm, B = 0.2 mm, C = 0.5 mm, D = 1 mm.

Toyohira-ku, Nishioka Park, Alt. 140 m, 27 Jul 2013, Lee JW (YNU).

Diagnosis. Female: Forewing 2.7 mm (2.7–2.9 mm), body 3.4 mm (3.4–3.5 mm).

Antenna tan brown. Dorsal part of antenna blackish brown. Thorax black. Hind leg brownish yellow with black base of tibia and brown tarsal claw. Abdomen black.

Ocellus moderately large, its diameter 0.3 times as long as distance between lateral ocellus and eye. Antenna with 34 flagellomeres. First flagellomere 1.1 times as long as wide. Malar space 3.0 times as long as basal mandibular width. Epomia present. Hind wing with six distal hamuli. Legs moderately stout, hind femur 2.2 times as long as wide. Ratio between lengths of hind tarsal segments 9 : 4 : 3 : 2 : 3. All tarsal claws simple. Basal area not separated from areola by carina. Propodeal spiracle 1.6 times as long as wide. 1st

tergite polished with a few punctures. Median dorsal carina strongly extending on basal 0.5 of the first tergite.

Male: No examined.

Distribution. South Korea (new record), Japan.

Region. Eastern Palearctic.

¹**Hypsicera spiracularis* Tolkantitz, 1995 (Fig. 6)

Hypsicera spiracularis Tolkantitz, 1995: 253. Type: female; TD: ZIN.

Material examined. South Korea: 1 ♀, Daejeon: Dong-gu, Yongun-dong, Daejeon Univ., 16 May–5 Jun 2006, Lee JW (YNU); 1 ♀, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, 24–30 May 2009, Lee JW (YNU); 1 ♂, Cheongdo-gun, Unmun-myeon, Haksodaepokpo, 29 Aug–19 Sep 2014, Lee JW (YNU); 1 ♂, GG: Yongin-si, Suji-gu, Mt. Gwang-

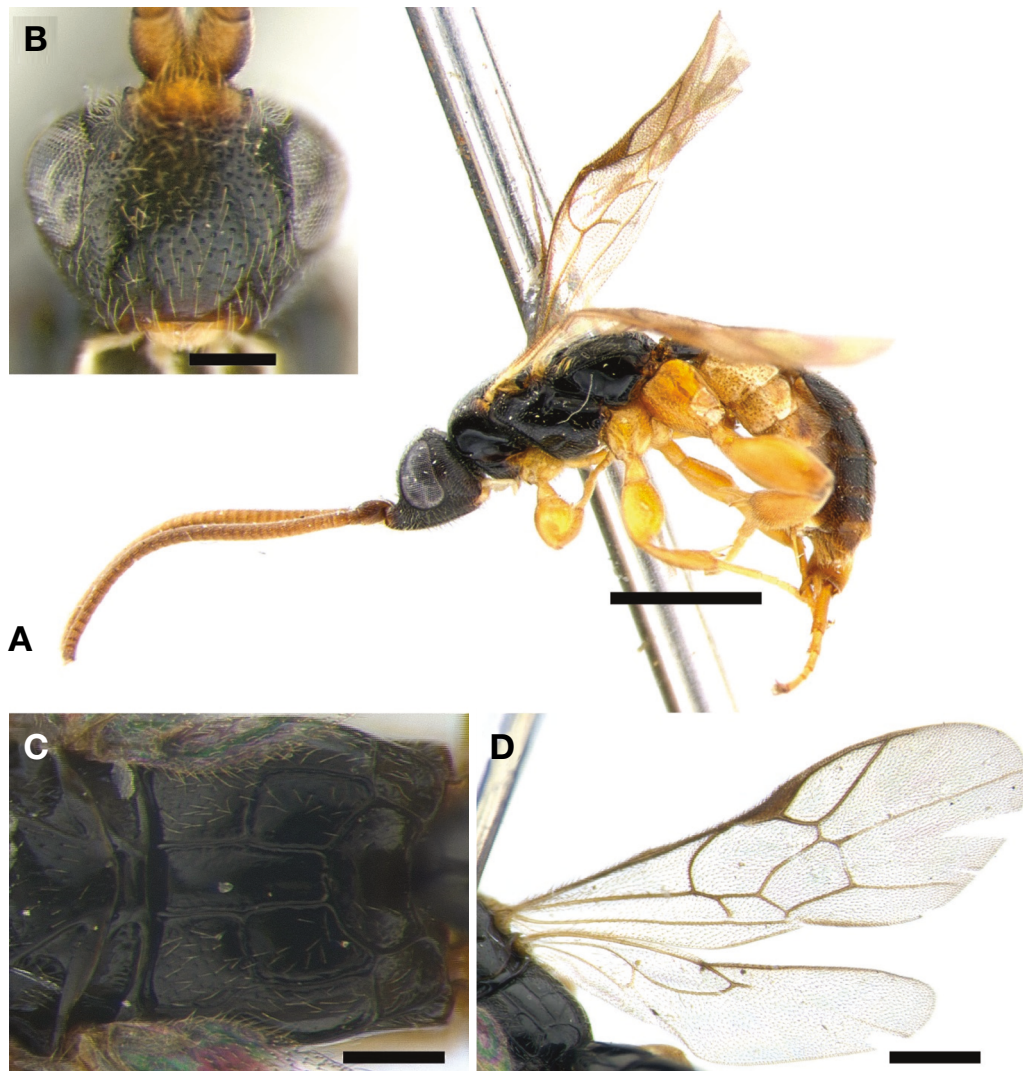


Fig. 5. *Hypsicera postfurcalis*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A=1 mm, B, C=0.2 mm, D=0.5 mm.

gyosan, 6–24 Sep 2008, Lim JO (YNU); 3♂♂, GN: Changnyeong-gun, Yuseo-myeon, Daedae-ri, Uponeup, 17 Jun–3 Jul 2015, Lee JW (YNU).

Diagnosis. Female: Forewing 2.3 mm (2.3–2.4 mm), body 4.3 mm (4.3–4.5 mm).

Antenna yellowish brown. Dorsal part of antenna brown. Thorax black. Hind coxa blackish brown. Trochanter and trochantellus yellow femur brown. Tibia yellow with black base and apical tarsus yellow. Tarsal claw brown. Abdomen black.

Ocellus moderately large, its diameter 1.1 times as long as the distance between the lateral ocellus and the eye. Antenna with 24 flagellomeres. Scape densely punctate. First flagellomere 1.4 times as long as wide. Malar space 2.4

times as long as basal mandibular width. Occipital carina present only laterally. Epomia strong. Hind wing with six distal hamuli. Legs moderately stout, hind femur 3.0 times as long as wide. Ratio between lengths of hind tarsal segments 24 : 11 : 6 : 5 : 7. Fore and mid tarsal claws pectinate. Hind tarsal claw simple. Basal area not separated from areola by carina. Propodeal spiracle 1.0 times as long as wide. Median dorsal carina strongly extending on basal 0.6 of the first tergite. Ovipositor sheath short, not surpassing tip of abdomen.

Male: Flagellum with 33 flagellomeres. Other characters as in female.

Distribution. South Korea (new record), Russia.

Region. Eastern Palearctic.

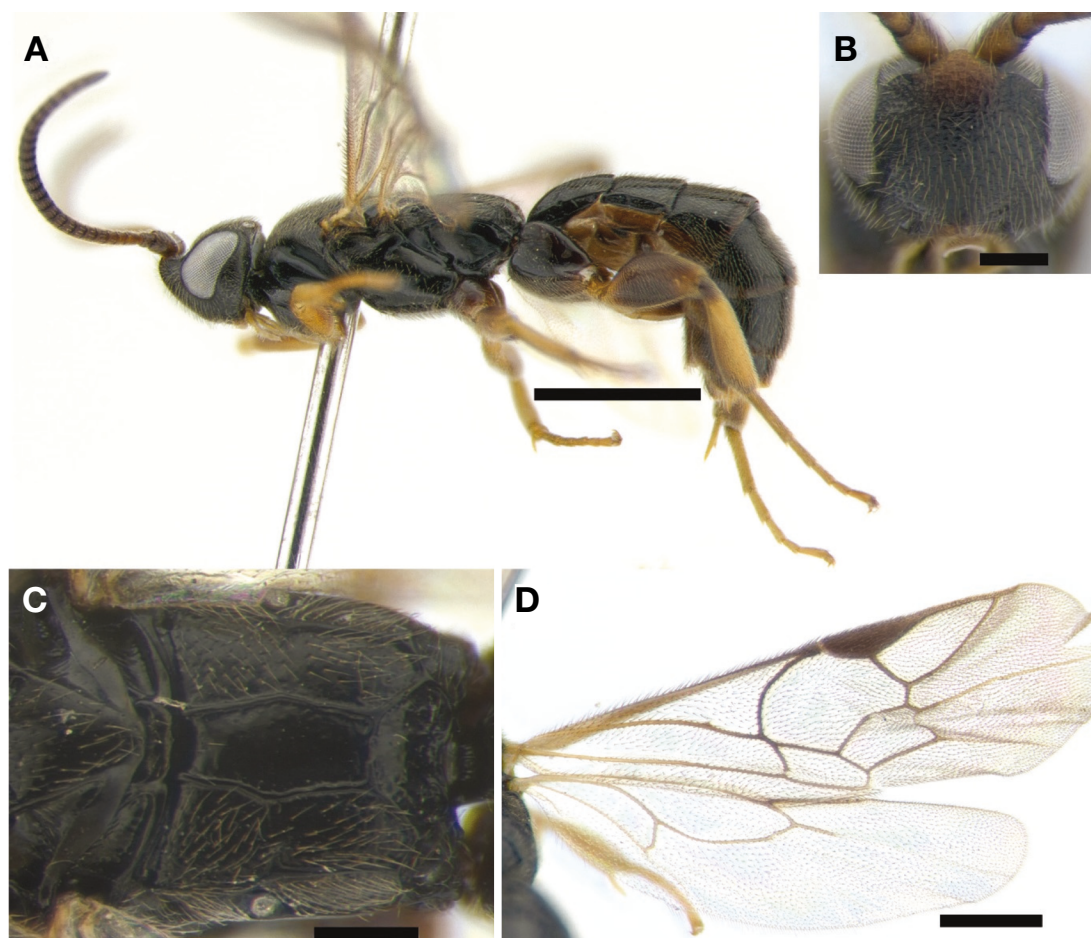


Fig. 6. *Hypsicera spiracularis*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A=1 mm, B, C=0.2 mm, D=0.5 mm.

^{1*}*Hypsicera yoshimotoi* Momoi & Kusigemati, 1970 (Fig. 7)

Hypsicera yoshimotoi Momoi & Kusigemati, 1970: 407.

Type: female; TD: BBM.

Material examined. South Korea: 1 ♀, Daejeon: Dong-gu, Daejeon Univ., 8 Oct–30 Nov 2007, Lee JW (YNU); 1 ♂, GB: Cheongdo-gun, Unmun-myeon, Unmunsa, 1 Aug 1989, Kim JG (YNU); 1 ♂, ditto, 28 Jun 1989, Kim JG; 1 ♀, GB: Gyeongsan-si, Dae-dong, Yeongnam Univ., 22 Jun 1989, Kim JG (YNU); 1 ♀, ditto, 3 Jul 1989, Kim JG; 1 ♀, ditto, 7 Sep 1988, Kim JG (YNU); 1 ♀, GG: Anyang-si, Manan-gu, Kwanag, 8–9 Aug 2008, Lim JO (YNU); 1 ♀, GN: Jinju-si, Gajwa-dong, 28 May 1989, Kim JG (YNU); 1 ♀, ditto, 15 Jul 1989, Kim JG (YNU); 1 ♂, ditto, 18–25 Aug 1987 (YNU); 2 ♂♂, GN: Sancheong-gun, Sicheon-myeon, Mt. Jirisan, Kim JG (YNU); 1 ♀, Sancheong-gun, Sicheon-

myeon, Jirisan National Park, Sunduryu, 3–12 Jun 1989, Kim JG (YNU); 1 ♂, ditto, 28 Jul 1989, Kim JG (YNU); 1 ♂, GN: Ulju-gun, Sangbuk-myeon, Icheon-ri, 25 Jun–15 Jul 1989, Kim JG (YNU); 1 ♀, JB: Jeongeup-si, Naejang-dong, Naejangsan National Park, Wonjeokam, 22 Aug–13 Sep 2006, Lee JW (YNU); 1 ♀, JN: Gurye-gun, Sandong-myeon, Jirisan National Park, Nogodan, 22 Aug 1997, Lee JW (YNU).

Additional material. China: 1 ♂, Jirin, Yanbian, Sanhezhen, Alt. 923 m, 22 Jul 2010, Lee JW (YNU).

Diagnosis. Female: Forewing 4.5 mm (4.4–5.0 mm), body 9.0 mm (8.3–9.7 mm).

Antenna gradate blackish brown basal to yellowish brown apical. Ventral part of scape yellow. Thorax black. Abdomen black. Each tergite with brown band apical.

Ocellus moderately large, its diameter 1.0 times as long as the distance between the lateral ocellus and eye. Antenna

Korean name: ^{1*}지리산수중다리몽톡맵시벌 (신칭)

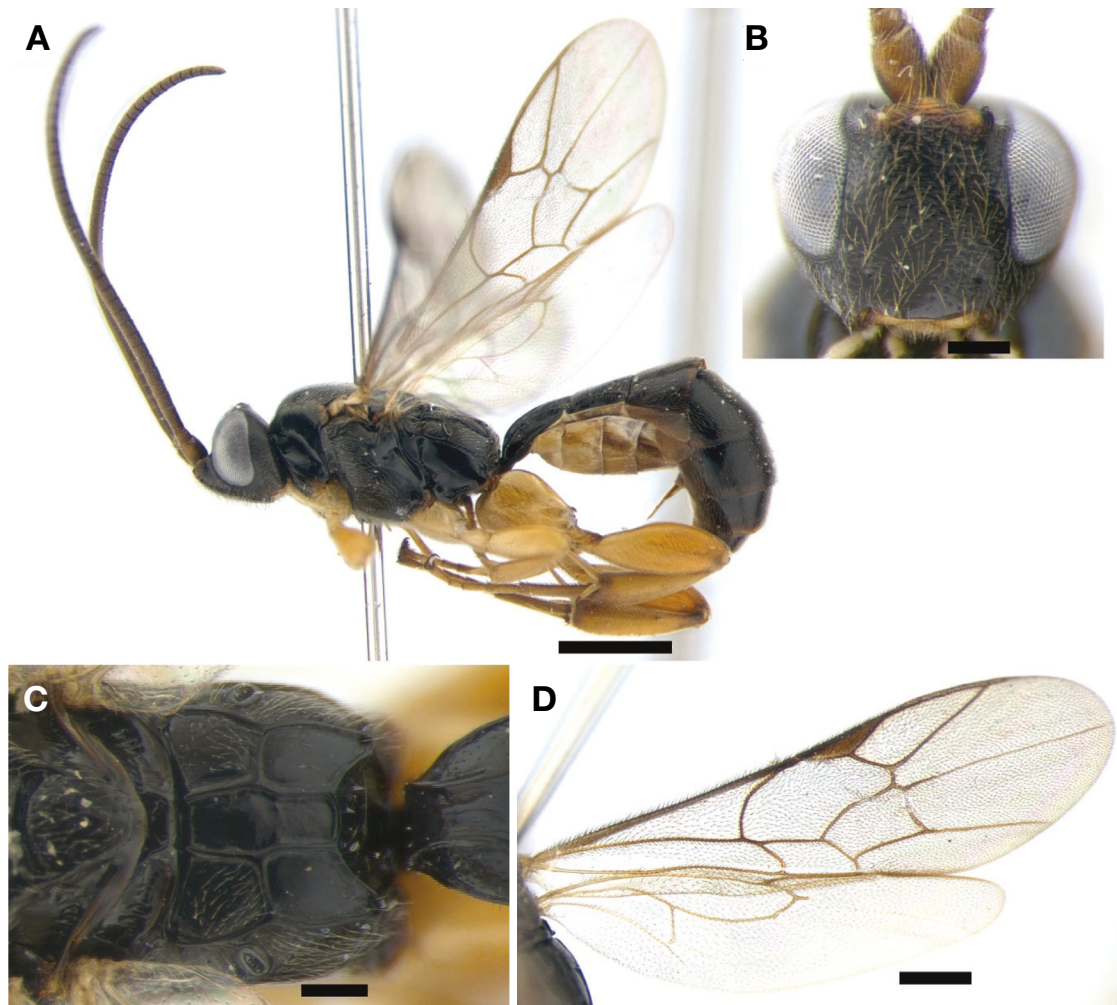


Fig. 7. *Hypsicera yoshimotoi*. A, Habitus in lateral view; B, Head in frontal view; C, Propodeum in dorsal view; D, Wings. Scale bars: A=1 mm, B, C=0.2 mm, D=0.5 mm.

with 36 flagellomeres. First flagellomere 2.2 times as long as wide. Malar space 2.1 times as long as basal mandibular width. Occipital carina present only dorsally. Epomia complete. Hind wing with six distal hamuli. Legs moderately stout, hind femur 2.3 times as long as wide. Ratio between lengths of hind tarsal segments 35 : 10 : 9 : 5 : 10. Apical tibial spur 0.5 times as long as basal one. Fore and mid tarsal claws pectinate. Hind tarsal claw simple. Basal area not separated from areola by carina. Propodeal spiracle 1.8 times as long as wide. Middle part of 1st and 2nd tergite polished without puncture. Median dorsal carina strongly extending on basal 0.4 of the first tergite.

Male: Almost same as female. Antenna with 34 flagellomeres.

Distribution. South Korea (new record), China (Jirin-new

record), Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

¹*Hypsicera carinata* Momoi & Kusigemati, 1970

Hypsicera carinata Momoi & Kusigemati, 1970: 412. Type: male; TD: HU.

Material examined. South Korea: 1♂, Daejeon: Donggu, Daejeon Univ., 16 May–5 Jun 2006, Lee JW; 2♂♂, ditto, 8 Oct–30 Nov 2007, Lee JW (YNU); 2♀♀ 3♂♂, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Simsimgyegok, 29 Aug–19 Sep 2014, Lee JW (YNU); 1♂, Gunwi-gun, Bugye-myeon, Dongsan-ri, Odoam, 15 Jul–29 Aug 2014, Lee JW (YNU); 1♂, Yeongcheon-si, Cheogn-tong-myeon, Eunhaesa, 9–22 May 2015, Lee JW (YNU);

Korean name: ¹*등줄수중다리몽톡맵시벌

1 ♀, GG: Anyang-si, Manan-gu, Kwanag, 26 Jul–7 Aug 2008, Lim JO (YNU); 1 ♂, ditto, 26 Jun–4 Jul 2007, Lim JO (YNU); 1 ♂, ditto, 15–25 Jul 2008, Lim JO (YNU); 1 ♂, GG: Namyangju-si, Choan-myeon, Songcheon-ri, Mt. Ungilsan, Alt. 99 m, 18 Aug–14 Sep 2009, Lim JO (YNU); 1 ♂, GN: Kwangju-si, Buk-gu, Seumgok-dong, Mt. Mu-deungsan, Wonhyosa, 26 Jun–27 Jul 2013, Choi JK (YNU); 1 ♂, Sancheong-gun, Samjang-myeon, Jangdang valley, 24 Aug 2011, Jeong JC (YNU); 1 ♀ 1 ♂, Sancheong-gun, Sicheon-myeon, Jungsan-ri, Jirisan National Park, Sunduryu, 9 Aug 1989, Kim JG (YNU); 1 ♀ 1 ♂, GW: Donghae-si, Samhwa-dong, Mureung valley, 21–30 May 2005, Lee JW (YNU); 1 ♂, Heungeop-myeon, Maeji-ri, Yeonsei Univ., 29 Jun–25 Jul 2011, Lee JW (YNU); 1 ♂, Inje-gun, Mt. Bangdaesan, 24 Jun 1996, Lee JW (YNU); 1 ♀, Wonju-si, Heungeop-myeon, Maeji-ri, Yeonsei Univ., 1–31 Jul 2010, Han HY (YNU); 1 ♂, JB: Buan-gun, Byeonsanbando, Ganbeolli, 4 Apr–25 Jul 2008, Jeong JC (YNU); 3 ♂♂, Jeongeup-si, Naejang-dong, Naejangsan National Park, Wonjeokam, 22 Aug–13 Sep 2006, Lee JW (YNU).

Distribution. South Korea, Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

¹**Hypsicera femoralis* (Geoffroy, 1785)

Ichneumon femoralis Fourcroy, 1785: 396. Type: female; TD: MHN. Lost.

Exochus laevis Cresson, 1864: 286. Lectotype: male; TD: ANSP.

Crypturus bonaerensis Schrottky, 1902: 100. Type: male. Lost.

Plesioexochus rufipes Cameron, 1905: 203. Type: female; TD: NHM.

Exochus platensis Brèthes, 1924: 10. Type: female; TD: MACN.

Exochus amicus ruficoxis Seyrig, 1934: 45. Lectotype: male; TD: MNHN.

Material examined. South Korea: 1 ♂, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, 1–24 Jul 2008, Lee JW (YNU); 1 ♂, Gunwi-gun, Bugye-myeon, Dongsan-ri, Odoam, 15 Jul–29 Aug 2014, Lee JW (YNU); 1 ♀, Gyeongsang-si, Dae-dong, Yeongnam Univ., 21 Apr–19 May 2004, Lee JW (YNU); 1 ♂, Yeongyang-gun, Mt. Heungrimsan, 20 Jul 1997, Lee JW (YNU); 3 ♀♀ 2 ♂♂, GN: Changnyeong-gun, Yueo-myeon, Daedae-ri, Uponeup, 5–25 May 2015, Lee JW (YNU); 2 ♀♀, Jinju-si, Gajwa-dong, 18–24 May 1990, Park JS (YNU); 1 ♀, ditto, 7–14 Jul 1987; 1 ♂, Sancheong-gun, Sicheon-myeon, Jirisan National Park, 10 Aug 1989, Kwon YJ (YNU); 1 ♀, Ulju-gun, Sangbuk-myeon, Icheon-ri, 6–13

Aug 1989, Kim JG (YNU); 1 ♀, GW: Donghae-si, Samhwa-dong, Mureung valley, 2–15 May 2007, Lee JW (YNU); 1 ♀, ditto, 5–25 Oct 2007, Lee JW (YNU); 3 ♀♀, JN: Gurye-gun, Masan-myeon, Hwangjeon-ri, Hwaem valley, 15 Jul–18 Oct 2011, Jeong JC (YNU); 1 ♂, ditto, 9 Jun–15 Jul 2011, Jeong JC (YNU); 1 ♀ 1 ♂, JN: Gurye-gun, Jirisan National Park, Toji-myeon, Piagol, 10–15 Jul 2011, Jeong JC (YNU).

Distribution. South Korea, China, Japan (Okinawa), Russia, Europe, South America, Africa, Armenia, Australia, Canada, Canary, Chile, Kazakhstan, New Zealand, USA.

Region. Afrotropical, Australasian, Eastern Palaearctic, Europe, Nearctic, Neotropical, Oceanic, Oriental, Western Palaearctic.

²**Hypsicera harrelli* Momoi & Kusigemati, 1970

Hypsicera harrelli Momoi & Kusigemati, 1970: 410. Type: female; TD: BBM.

Material examined. South Korea: 1 ♀, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, 24 Jul–15 Aug 2008, Lee JW (YNU); 1 ♀, Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Haksodaepokpo, 12 Aug–22 Sep 2012, Lee JW (YNU); 1 ♀, Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Simsimgyegok, 30 Jul–29 Aug 2014, Lee JW (YNU); 1 ♀ 1 ♂, GG: Anyang-si, Manan-gu, Kwanag, 26 Jun–4 Jul 2007, Lim JO (YNU); 1 ♀, GN: Geochang-gun, Wicheon-myeon, Sangcheon-ri, 4 Jun 2014, Choi JK (YNU); 2 ♀♀, Hadong-gun, Hwagae-myeon, Jirisan National Park, Daeseonggol, 29 Jul 1987, Kim JG (YNU); 1 ♀, Sancheong-gun, Sicheon-myeon, Jungsan-ri, Jirisan National Park, Sunduryu, 28 Jun 1989, Kim JG (YNU); 1 ♀, GW: Wonju-si, Panbu-myeon, Mt. Baegunsan, 30 Jul–28 Aug 2013, Lee JW (YNU).

Distribution. South Korea, Japan, Russia.

Region. Eastern Palaearctic, Oriental.

³**Hypsicera makiharai* Kusigemati, 1971

Hypsicera makiharai Kusigemati, 1971: 257. Type: male; TD: HU.

Material examined. South Korea: 1 ♂, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Haksodaepokpo, 22–28 Jun 2014, Lee JW (YNU); 1 ♂, GN: Millyang-si, Danjang-myeon, Sajapyeong, 25 Jun 1987, Kim JG (YNU); 1 ♂, Ulju-gun, Sangbuk-myeon, Icheon-ri, 25 Jun 1987, Kim JG (YNU); 2 ♂♂, GW: Wonju-si, Panbu-myeon, Mt. Baegunsan, 30 Jul–28 Aug 2013, Lee JW (YNU).

Distribution. South Korea, Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

¹Hypsicera nigribasis* Momoi & Kusigemati, 1970***Hypsicera nigribasis* Momoi & Kusigemati, 1970: 411.

Type: male; TD: MOMOI.

Material examined. South Korea: 1 ♂, GB: Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Haksodaepokpo, 29 Aug–19 Sep 2014, Lee JW (YNU); 1 ♂, Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, Sinsimgyegok, 29 Aug–19 Sep 2014, Lee JW (YNU); 1 ♂, Cheongdo-gun, Unmun-myeon, Unmunsa, 6 Jun–1 Jul 2008, Lee JW (YNU); 1 ♂, Choilgok-gun, Dongmyeong-myeon, Hakmyeong-ri, Gasansanseong, 30 Aug–22 Sep 2014, Lee JW (YNU); 4 ♂♂, Gunwi-gun, Bugye-myeon, Dongsan-ri, Odoam, 15 Jul–29 Aug 2014, Lee JW (YNU); 1 ♀, GN: Jinju-si, Gajwa-dong, 28 Jul–4 Aug 1987, Park JS (YNU); 1 ♂, Sancheong-gun, Sicheon-myeon, Jungsan-ri, Jirisan National Park, Sunduryu, 24 Jun 1989, Kim JG (YNU); 1 ♂, Sancheong-gun, Sicheon-myeon, Jirisan National Park, 15–21 Aug 1989, Lee JW (YNU); 1 ♀, GW: Donghae-si, Samhwa-dong, Mureung valley, 2–15 May 2007, Lee JW (YNU); 1 ♂, JN: Gurye-gun, Toji-myeon, Jirisan National Park, Piagol, 10 Mar–15 Apr 2010, Lee JW (YNU); 1 ♂, Seoul: Nowon-gu, Sanggye-dong, Mt. Suraksan, 18–24 Jul 2007, Lee JW (YNU).

Description. Female: Forewing 3.0 mm, body 5.0 mm.

Black. Head black. Palpi bright yellow. Clypeus and mandible blackish brown with yellow mandibular teeth. Antenna yellow with yellowish brown apex, its dorsal part brown. Thorax black. Tegula yellow. Fore and mid leg bright yellow. Hind leg yellow with brown basal tibia and tarsal claw. Wings hyaline. Abdomen brownish black. 3rd–4th tergite with reddish brown apical.

In dorsal view, head narrowed behind eyes, convex. Temple shorter transversal diameter of eye. Ocellus small, its diameter 0.5 times as long as the distance between the lateral ocellus and eye. Frons small, its antennal scrobe convex, polished with fine, dense punctures. Antenna with 32 flagellomeres, filiform. Scape densely punctate. First flagellomere 1.1 times as long as wide. Face almost square densely regularly punctate. Clypeus not separated from face, without punctures. Mandible tapered apically. Malar space 3.0 times as long as basal mandibular width. Occipital carina present above and laterally.

Epomia present, notaulus absent. Postscutellum flat polished with dense, fine puncture. Scutellum flat polished with sparse puncture. Propleuron polished with fine puncture, pronotum polished without puncture, strongly concave. Mesopleuron polished with fine puncture, speculum polished without puncture, concave. Prepectal carina complete, reaching subtegular ridge. Metapleuron polished without

puncture, pleural carina straight. Submetapleural carina complete. Hind wing with five distal hamuli. Legs moderately stout, hind femur 2.5 times as long as wide. Ratio between lengths of hind tarsal segments 30 : 9 : 8 : 5 : 10. All tarsal claws simple. Basal area not separated from areola by carina. Combined basal area and areola shiny without puncture. Propodeal spiracle 2.0 times as long as wide.

Abdomen polished, with fine punctures, more indistinct on basal 1st and 2nd tergite. Median longitudinal carinae strongly extending on basal half of the first tergite. Ovipositor sheath short, not surpassing tip of abdomen.

Distribution. South Korea, Japan (Okinawa).

Region. Eastern Palaearctic, Oriental.

Remark. This is the first description of the female characteristics of the species.

²Hypsicera rugosa* Kusigemati, 1971**

Hypsicera rugosa Kusigemati, 1971: 255. Type: female; TD: HU.

Material examined. South Korea: 1 ♂, GW: Panbu-myeon, Mt. Baekunsan, 30 Jul–28 Aug 2013, Lee JW (YNU); 1 ♀, JB: Jeongeup-si, Bokheung-myeon, Songgotbawi, 19 May 2004, Kim KB (YNU).

Distribution. South Korea, Japan.

Region. Eastern Palaearctic.

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Korean name: ¹*꼬마수중다리뚝뚝맵시벌, ²*수중다리뚝뚝맵시벌

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